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ALAUDES

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The little beetles of the genus Alaudes are among the most singular and interesting of our blind Coleoptera. The original specimens were collected by Dr. George H. Horn in or about 1864 in Owens Valley in eastern California, and were described by him as *A. singularis* in 1870 in his Revision of the Tenebrionidæ. Horn cites simply "California" in his description, but the locality named above is that given by me in my Coleoptera of southern California, and is doubtless correct though I cannot at the moment recall my source of information.

As indicated in the reference quoted, the next record of capture was by Professor Wickham, who about 1890 secured a few specimens in southeastern Oregon; then a single example by Koebele in the Argus Mountains of southeastern California not far south of the original habitat.

In 1893 and 1895 I took about a dozen examples from beneath boards in my garden at Pomona, California, and in 1897 Dr. Fenyes collected about an equal number at Azusa, some fifteen miles west of Pomona. Since then Dr. Fenyes, Mr. J. O. Martin and the writer have on a number of occasions taken specimens at Pasadena. In his recent paper on this genus Dr. F. E. Blaisdell mentions the taking of a single specimen by himself at San Diego in 1890, also a series collected by Nunenmacher at Goldfield, Nevada (1907), and a few examples by Dr. Van Dyke in Alameda County, California. This about exhausts the record of captures so far as known to me, and shows that the genus is distributed from southern California to Oregon.

All specimens collected conform very closely in size, appearance and general characters to the original of Horn's description, and up to the time of Dr. Blaisdell's paper (Trans. Am. Ent. Soc., 1919), it was generally assumed that of so singular an insect we had but a single species. Moreover the things were so scarce that very few collections contained examples

from more than one locality, so that opportunities for comparison were limited. Dr. Blaisdell's paper then represents the first attempt to get together and carefully compare material from different localities, and as a result of his study he has announced the existence of four distinct species in the material examined.

Aside from some quite obvious variations in the form of the erect elytral scales, and some small differences in bodily outline, there is almost nothing of moment on which to base specific distinctions, and it is quite possible that none of the observed variations are more than racial in character. I am, however, for the present inclined to accept the doctor's conclusions as in the main correct, and this view is supported by the fact that with one probable exception, so far as the material in hand is concerned, the supposed species are quite constant, and each so far as known occurs with a different species of ant.

The small and more or less illusory differences in the form of the scutellum referred to by Dr. Blaisdell I cannot believe have any specific significance, my own experience being that the scutellum is transversely triangular with but slight variation, in all forms.

It is somewhat remarkable that neither Horn nor Blaisdell anywhere speaks with precision with respect to the erect scales of the elytral intervals, the implication in their descriptions being that all the intervals are thus clothed, whereas it is always only the alternate ones that are so affected.

It is necessary to correct one error in Blaisdell's paper of which I seem to have been unwittingly the cause. His identification of *singularis* Horn is based on a series of examples taken by Mr. J. O. Martin in Pasadena, where Mr. Martin and I together collected the species, and for which I used the name *singularis* merely because I shared the general assumption that all Alaudes were of one species. I had not at that time seen Horn's type series, and had the doctor communicated with me I should promptly have disavowed any authority in the matter. I have since examined the Horn types and can say positively that they not only differ from this Pasadena species, but also in greater or less degree from all other species of Blaisdell's table.

On the supposition that the kind of differences observed in

this genus are of the order of specific characters, there are in my collection two other forms meriting distinctive names. The following table contains all at present known to me.

Table of Species

1. Elytral vestiture typically slender and hair-like throughout, but varying to feebly clavate, especially toward the sides and apex; marginal setæ virtually uniform in form and length ..... *setigera*

—. Elytral vestiture feebly clavate except along the side margins, where long slender setæ alternate with the much shorter clavate ones ..... *alternata*

—. Elytra vestiture nearly uniformly moderately clavate throughout, form of elytra distinctly narrower and more parallel ..... *squamosa*

—. Elytral vestiture consisting throughout of rather shorter capitate clavate scales of uniform length 2

2. Hind angles of thorax including the investing scales somewhat obtuse; elytral punctures very coarse, all the interspaces narrower than the punctures ..... *singularis*

—. Hind angles of thorax sharply rectangular or even a little prominent; elytral punctures rather smaller, at least toward the suture, where the interspaces are as wide or wider than the punctures 3

3. Prothorax not appreciably narrower than the elytra, form more oblong ..... *fallax*

—. Prothorax perceptibly narrower than the elytra at middle, the latter shorter and slightly oval ..... *testacea*

1. ALAUDES SETIGERA Blaisd.

Trans. Am. Ent. Soc., XLV (1919), p. 310
singularis Blaisd. (not Horn), ibid., p. 307

With the San Diego type of this species, characterized by Blaisdell as having the erect vestiture of the elytra "slender and hair-like," I am compelled to unite the Pasadena species erroneously regarded by him as the *singularis* of Horn. Of this latter he says: "Four of the sixteen specimens of Mr. Martin's series have all the elytral scales quite linear but not hair-like or setiform." In a good series of this species in my collection there are individuals in which the elytral vestiture, if not precisely identical, is so nearly like that of *setigera* as to forbid dissociation. Of one of these, recently sent to the doctor for an expression of opinion, he writes: "I consider it to be *setigera*." The transition between these specimens and those having the

elytral setæ in greater or less part fusiform to feebly claviform is perfectly gradational.

Type locality—San Diego, California. All other specimens known to me were taken at Pasadena, California, where they occur in the Arroyo Seco under stones, with *Formica pilicornis* Emery.

2. **Alaudes alternata** Fall, n. sp.

The chief distinguishing character of this species is the alternation of moderately slender clavate scales with much longer hair-like setæ along the lateral edge of the elytra. There is another feature not mentioned in the table which seems quite constant. In the present species the prothorax is widest close to the apical angles, from which point the sides converge obliquely backward with a moderate degree of sinuation. In *setigera* the point of maximum width is less near the front angles, the sides showing a longer anterior arcuation followed by a deeper sinuation; the hind angles being rectangular in both species. The erect elytral scales are nearly uniformly gradually feebly clavate, but some variation within narrow limits is observable on close attention. The sutural interspace is wider than the adjacent strial punctures, and the next one or two intervals are usually as wide as the punctures. The form of the elytra is nearly the same as in *setigera*.

Length, 1.6 to 1.75 mm.; width, .6 to .7 mm.

Habitat. Pomona (type) and Azusa (Fenyes), Los Angeles County, California.

The first specimen of this species was found by me November 5, 1893, beneath a board in my garden at Pomona. Two years later, during the first half of November 1895, one or two specimens at a time were found in like situations until about a dozen were secured. About half of these were distributed by myself or the late Mr. Ricksecker as *A. singularis*; six examples remain in my cabinet. None of these specimens appeared to be associated with ants, but Dr. Fenyes a few years later took a small series at Azusa in April in nests of *Solenopsis molesta*

validiuscula Emery, one of which with the host ant is in my collection.

3. Alaudes squamosa Blaisd.

Trans. Am. Ent. Soc., XLV (1919), p. 309

This species was described from a series of specimens collected by Mr. F. W. Nunenmacher at Goldfield, Nevada, October 18, 1907. It is rather narrower, with the sides of the elytra more strictly parallel than in any of our other species. The erect elytral scales are more distinctly clavate than in the two preceding species, but less strongly so than in those which follow. Blaisdell describes the hind angles of the thorax as obtuse, but in two paratypes sent me by Mr. Nunenmacher they are not perceptibly so, and I should certainly call them rectangular. The prothorax is widest far forward, the outline being nearly as in *alternata*.

The specimen in the National Museum collection from the Argus Mountains, southeastern California, taken by Koebele, appeared to me to be referable to the present species when examined by me some years ago. The specimens sent me by Nunenmacher were accompanied by the host ant, which proves to be *Cremastogaster californica* Emery.

4. Alaudes singularis Horn

Trans. Am. Phil. Soc., XIV (1870), p. 362

This, the original species of the genus, is represented by three specimens in the Horn collection. A fourth specimen had evidently once been present, but at the time of my visit was not on the "point" nor could I find it in the bottom of the box. There are also two examples in the LeConte collection, evidently a part of the original series taken by Horn in the Owens Valley, California. I have seen no others.

This species is noticeably stouter than *squamosa,* the sides of the thorax less sinuate, more oblique, with the hind angles perceptibly obtuse. The elytral punctures are all very coarse, the interspaces narrower than the punctures even near the suture. The erect scales are short and nearly uniformly strongly capi-

tate clavate, in which respect this species is comparable only with the two following. According to Horn specimens were very rare and were found living with a small black ant under stones. This ant is evidently a different species from others with which Alaudes has occurred.

5. **Alaudes fallax** Fall, n. sp.

Oblong-oval, similar in form to *setigera,* with which it agrees in having the point of maximum width of the thorax less close to the apical angles than it is in *alternata* and *squamosa.* The elytral scales are short, uniform throughout, and strongly capitate clavate. The first two or three elytral interspaces are as wide or wider than the adjacent rows of punctures. The prothorax and elytra are sensibly equal in width, and the hind angles of the former with their investing scales are rectangular.

Described from two examples taken by the writer at Pasadena, California, in nests of *Solenopsis geminata mariosa* Wheeler, and bearing dates April 6, 1912, and March 9, 1913. The latter is taken as the type.

This species is closest to *singularis,* differing in its longer anterior arcuation of the sides and rectangular hind angles of the thorax, and in its less coarse elytral striæ with correspondingly wider interspaces. The host ant is a different species.

6. ALAUDES TESTACEA Blaisd.

Trans. Am. Ent. Soc., XLV (1919), p. 311

This species is closely allied to the two preceding, with which it agrees in elytral vestiture. The elytra are somewhat shorter and a little more oval than in any of our other species, and are perceptibly wider than the thorax. A few specimens were collected in Alameda County, California, by Dr. Van Dyke, who has kindly sent me a paratype for examination. I do not know whether any of the host ants were secured.[1]

For more detailed descriptions of the species known to him see Dr. Blaisdell's paper.

I am indebted to Dr. William M. Wheeler for the identification of the ants mentioned in the present paper.

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1 Note by Dr. E. C. Van Dyke. This host was a species of the acrobat ant (Cremastogaster sp.).